

Summary

Introduction

Bonneville Power Administration (BPA) is a federal agency responsible for purchasing, developing, and marketing electrical power to utility, industrial, and other customers in the Pacific Northwest, pursuant to the Bonneville Project Act of 1937, the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (P.L. 96-501; the Northwest Power Act), and other statutes. BPA wishes to encourage the development of renewable energy resources in the Pacific Northwest to meet customer demand for power, to diversify its resource portfolio, and to meet its obligations under the Northwest Power Act.

Deregulation of the electric industry and subsequent energy supply issues, as well as the current low-water year, have emphasized the need for new and diverse energy sources in the region. Renewable resources like wind would not only help diversify BPA's resource portfolio, but are preferred by many consumers concerned about environmental effects of other power sources. BPA has developed and marketed output from renewable power projects as "green power" as a way to satisfy demand from these consumers and to increase the amount of new renewable energy resources in the region's power supply. The Northwest Power Planning Council's Fourth Conservation and Electric Power Plan recommended that Northwest utilities offer green power purchase opportunities as a way to help the region integrate renewable resources into the power system in the future.

In October 1999, SeaWest WindPower, Inc. (SeaWest) submitted a proposal to BPA to identify one or more sites in Oregon and Washington at which wind power facilities could be developed. After considering preliminary information regarding several sites identified by SeaWest, BPA decided to examine a proposed wind project located near Condon, Oregon, and to consider purchasing power from a wind power facility that would be constructed by SeaWest at the site.

The National Environmental Policy Act (NEPA) (42 U.S.C. Sections 4321 et seq.) requires federal agencies to prepare and circulate an environmental impact statement (EIS) for major federal actions or decisions that could significantly affect the quality of the human environment, including the natural and physical environment.

BPA's decision whether or not to purchase power from the proposed wind project and transmit it over BPA transmission lines will consider the information in this EIS, public comments, and other factors.

This EIS provides environmental information to the public and federal, state, and local agencies, officials, and decision makers regarding the effects of the proposed action and responds to public and agency comments on the Draft EIS, and provides necessary clarifications, elaborations, and minor revisions to the draft.

In the face of regional growth in electrical loads and increasing constraints on the existing energy resource base, BPA needs to acquire resources that will contribute to diversification of the long-term power supply in the region.

The purposes of acquiring a diverse resource portfolio include:

- protecting BPA and its customers against risk;
- ensuring consistency with BPA's responsibility under the Northwest Power Act to encourage the development of renewable energy resources;
- meeting customer demand for energy from renewable energy resources, thereby assuring consistency with BPA's Business Plan EIS (DOE/EIS-0183, June 1995) and Business Plan Record of Decision (ROD);
- ensuring consistency with the resource acquisition strategy of BPA's Resource Programs EIS (DOE/EIS-0162, February 1993) and ROD; and
- meeting the objective in the January 2000 Strategic Plan of BPA's Power Business Line to acquire at least 150 average megawatts (MW) of new renewable resources by the end of fiscal year 2006 in order to meet customer demand for new renewable resources.

BPA's preferred alternative is the proposed action to execute one or more power purchase and transmission services agreements to acquire and transmit up to the full electrical output of the proposed Condon Wind Project. The proposed action is the only alternative that meets the underlying need for action and best meets the purposes of action. The preferred alternative is also the environmentally preferred alternative.

Project Site and Wind Resource

The project site is located on both sides of Highway 206 (ORE206), approximately 5 miles northwest of the town of Condon in Gilliam County, Oregon. The 38-acre project site is within a 4,200-acre study area¹ (see Figure S-1) consisting of gently sloping plateaus and rolling, arid hills traversed by shallow canyons. In general, the elevation of the project site and study area ranges from approximately 2,400 feet to 3,300 feet.

Within the project site, the wind project facilities would occupy a permanent footprint of approximately 21 acres for the 24.6-MW first phase and an additional 17 acres for the second phase (38 acres total). The project has been designed to locate the turbines on the relatively flat (and predominately cultivated) tops of plateaus to take advantage of the best wind resources while minimizing potential environmental impacts.

The project site consists of private farmland that is used for non-irrigated agriculture (primarily winter wheat and barley), cattle grazing, or land that is in the Conservation Reserve Program (CRP). The General Plan for Gilliam County, and the implementing zoning regulations, designate the project site as "Exclusive Farm Use." Facilities for generating electricity from wind energy can be permitted in Exclusive Farm Use zones pursuant to a conditional land use permit. Such a permit would be issued by Gilliam County, in accordance with county procedures.

¹ The *study area* is the 4,200-acre study area shown in Figure S-1. The *project site* is the location (covering 38 acres) within the broader study area, of the proposed phase 1 and phase 2 wind turbine strings, project access roads, O&M building, electrical substation, and electrical transmission line connecting to BPA's Condon-DeMoss line.

The project site is well exposed to the winds in all directions; however, the prevailing winds blow from the southwest and northwest across the project site toward the east. The winds are expected to be strongest from late fall through spring.

Historical wind data collected near Wasco, Oregon; Goodnoe Hills, Washington; and Kennewick, Washington, indicate that the Condon area has sufficient winds for wind project development. Currently three temporary meteorological towers are measuring wind data at the project site to confirm the wind resource potential.

Project Components and Construction Phases

The proposed project would consist of a wind project and its associated electrical system. The project would use modern, efficient 600-kilowatt (kW) wind turbines to convert energy in the winds near Condon, Oregon, to electricity that would be transmitted over the BPA transmission system. The project would consist of one or two phases: the first phase would use 41 wind turbines to yield a capacity of approximately 24.6 MW. A second phase (if built) would use 42 wind turbines to yield a capacity of approximately 25.2 MW. The first phase is proposed for construction in late 2001; the second phase could be constructed during spring/summer of 2002 or later.

An estimated 60 to 70 delivery and construction workers and technicians would work onsite over the duration of the construction period for each phase. However, not all personnel would be onsite at the same time. Their presence onsite would be phased, depending on the pace of construction, over an estimated construction and equipment testing period of 4 to 5 months for each phase, or possibly longer if seasonal weather delays occurred. Estimated project employment would not exceed 30 workers at any one time.

Major components of the wind project include the following.

Wind turbines and foundations: The 600-kW wind turbines under consideration for the project have the design features shown in Table S-1. The poured concrete foundations would be approximately 12 feet in diameter. Foundation depth would depend on soil and local geologic (bedrock) conditions. The tubular support towers would be constructed of heavy rolled steel that would be fabricated offsite, trucked to the project site in two or more sections, and assembled onsite. The towers would be smooth, with no avian perch locations, and finished in a light gray to blend into the landscape and sky. There would be three rotor blades on each turbine. Each blade would be constructed in one piece, typically of fiberglass, or a fiberglass composite, with a smooth, white or black outer surface (a black coating may be applied to reduce blade icing). The wind turbines would be fitted with self-diagnostic computer monitoring and control systems located inside the turbine towers.

The Federal Aviation Administration may recommend that tower markings or aviation safety lighting be installed on a portion of the towers or nacelles. Otherwise, the completed project would normally have no lights at night.

Table S-1. Project Wind Turbine Features

Design Feature	Description
Rated output of turbine	600 kW
Minimum wind speed for turbines to begin operating	10 mph
Number of blades	Three
Rotor (blade) diameter	154 feet
Tower type	Tubular steel
Tower hub (nacelle) height	197 feet
Total height (to top of vertical rotor blades)	274 feet
Rotational speed	24 rotations per minute
Color	White or black blades and gray towers and nacelles

Meteorological towers: Two to four permanent meteorological towers are planned. The towers would house wind measurement instruments. Each tower would have a small concrete foundation with supporting cables extending to anchor points.

Power collection and communication system: The electrical system for the proposed project would collect and convert the electricity from each wind turbine into higher voltage electricity which would be conveyed through a project substation to BPA's Condon-DeMoss transmission line. Electrical and communication cables would be installed underground where possible, or overhead on poles, or a combination of both installation techniques.

Operation and maintenance (O&M) building: The O&M building would consist of an enclosed bay for storage of back-up equipment parts and supplies; an office for administration and monitoring of the facility, including the wind turbines; an emergency shelter for workers during winter storms; and parking for vehicles. The O&M building may be located either on the project site or offsite in an existing structure within the City of Condon. If located onsite, the O&M building would probably be located east of ORE206, south of the grange hall (Figure S-1).

Project access roads: Access to the project site would be directly from ORE206 onto project access roads located on private farmland. Some of the project access roads are existing farm roads that would be graveled and/or relocated for project use, while the balance of project access roads would be new.

Lands used temporarily during construction (such as construction staging areas, excess road margins, etc.) would be restored to their approximate condition prior to construction. Since most construction would occur on land that is ordinarily plowed fields, reclamation of those lands may consist of replowing and planting for the next crop season. On all other disturbed lands, reclamation activities would be planned to complement landowner decisions as to compatibility between crops, as well as reclamation practices and plant species to be used. If any areas of native vegetation on the project site were disturbed, they would be revegetated with species native to the area and appropriate for that location.

Project Operation and Maintenance

Routine maintenance of the turbines would consist primarily of daily travel, generally by pickup trucks, of two to four operation/maintenance staff who would test and maintain the wind facilities (or six personnel after phase 2 is completed). Most servicing would be performed “up-tower” (within the nacelle, without using a crane to remove the turbine from the tower). Occasionally the use of a crane and possibly equipment transport vehicles may be necessary for cleaning, repair, adjustments, or replacement of the rotors or equipment contained in the nacelle. Additionally, all roads, pads, and trenched areas would be regularly inspected and maintained to minimize erosion.

Monitoring the operations of the wind turbines would be conducted both from computers located in the base of each turbine tower and from the O&M facility using telecommunication linkages and computer-based monitoring.

Project Decommissioning

At the end of the project’s useful life, the owner would obtain any necessary authorization from the appropriate regulatory agencies and from the landowners to decommission the facilities. Decommissioning involves removing the turbines and support towers, transformers, and substation, and removing the upper portion of foundations so that they do not interfere with agricultural practices. Generally turbines, electrical components, and towers would either be resold or recycled. All unsalvageable materials would be disposed of at authorized sites in accordance with laws and regulations.

No Action Alternative

An EIS must consider the alternative of not taking the proposed action. Under the No Action Alternative, BPA would not execute one or more power purchase and transmission services agreements to acquire and transmit up to the full electrical output of SeaWest’s proposed Condon Wind Project. Because BPA’s transmission line is the only transmission line nearby, it is highly unlikely that the project would be implemented without a commitment from BPA to acquire the energy output or transmit it over BPA transmission lines to another purchaser. Without BPA’s commitment, the project would not be constructed or operated, and the resulting environmental impacts described in this EIS would not occur.

However, the region’s need for power is expected to continue to grow (as documented in the Northwest Power Planning Council, Fourth Northwest Power Plan; Energy Information Administration, Annual Energy Outlook 2001). Under the No Action Alternative, a greater proportion of other energy resources would be developed. The predominant resource is most likely to be combined-cycle combustion turbines (CTs) fueled by natural gas (Northwest Power Planning Council, Northwest Power Supply Adequacy/Reliability Study Phase 1 Report, Paper Number 2000-4, March 6, 2000). BPA’s Resource Programs EIS (RP EIS) and Business Plan EIS included an evaluation of the environmental impacts of energy resources including CTs.

Affected Environment and Environmental Impacts

The affected environment, potential impacts, and mitigation for the resource disciplines evaluated in this EIS are briefly described below. Potential impacts of the proposed project are summarized and the level of each impact is included in parentheses following the impact description.

Table S-2, at the end of this Summary, displays the potential impacts from the proposed project and mitigation measures in a matrix format.

Land Use and Recreation

Affected Environment

The majority of Gilliam County is zoned Exclusive Farm Use (EFU), including the study area and adjacent lands. The proposed wind power project would require a Conditional Use Permit for construction in the EFU zone. The proposed project would also necessitate a Goal Exception to Oregon Statewide Planning Goal 3, which states that agricultural lands shall be preserved and maintained for farm use.

The project site and study area are composed of privately owned land used primarily for non-irrigated agriculture (primarily crops, including barley and wheat). A small portion of the project site and study area (13 percent and 8 percent, respectively) is currently held as CRP land.

Additional land uses within and adjacent to the study area include an active gravel quarry, a grange hall, a meteorological station, abandoned farming/ranching equipment and implements, and low-density houses with barns and accompanying outbuildings. A PGT-PG&E natural gas pipeline traverses northeast to southwest across the southern part of the study area, and the 69-kV BPA Condon-DeMoss transmission line runs generally parallel to ORE206.

There are no formal recreational amenities within the study area. Hunting may be allowed by landowner permission in some portions of the study area.

Construction Impacts

- Approximately 104 acres temporarily disturbed (58 acres in phase 1 and 46 acres in phase 2). Phase 1 temporary disturbance includes approximately 30 acres cultivated cropland and 4 acres CRP land; phase 2 temporary disturbance includes approximately 35 acres cropland and 10 acres CRP land. (Low)
- Temporary interruption of upland bird hunting in the vicinity of the project site. (Low)
- Potential minor increase in roadside sightseeing. (Low)

Operation and Maintenance Impacts

- Conversion of approximately 38 acres for permanent project facilities (21 acres for phase 1, 17 acres for phase 2). Total land converted includes approximately 25 acres cropland and 5 acres CRP land, which represents a very small to negligible portion of the agricultural acreage in the study area and Gilliam County. (Low)

Decommissioning Impacts

- Same as construction. (Low)

Mitigation Measures

- No mitigation measures are warranted for the low potential impacts to land use or recreation from the proposed project.

Geology, Soils, and Seismicity

Affected Environment

The project site and study area are located in the north-central portion of Oregon within the Deschutes-Columbia Plateau, with geology dominated by Columbia River Basalt. The project site and study area are located along ridges and uplands that are dissected by a network of streams. The ridges have a relatively thin layer of soil (1 to 3 feet deep) over basalt. The erosion potential is generally slight to moderate, and higher on steep slopes. None of the study area is irrigated farmland, so it does not qualify and has not been designated as prime, unique, or of statewide importance under the Farmland Protection Policy Act.

The type of earthquake events likely to occur in the project site and study area would be expected to cause slight damage to property and structures.

Construction Impacts

- Modification of topography and temporary soil disturbance from road improvements, road construction, staging area clearing, and underground trenching could potentially induce erosion or unstable slopes. (Low)
- Removal of vegetation. (Low)
- Stormwater runoff. (Low)
- Potential for earthquake damage to facilities. (Low)

Operation and Maintenance Impacts

- Potential erosion at project facility. (Negligible)

Decommissioning Impacts

- Similar to construction. (Low)

Mitigation Measures

- No mitigation measures are required beyond the standard approved construction practices and erosion management techniques that would be employed to prevent mass wasting and control potential erosion to near existing levels.

Fish

Affected Environment

No fish-bearing streams are located in the project site or study area. Several fish-bearing streams drain the general project vicinity, including Hay Creek, Dry Fork Hay Creek, and Sixmile Canyon (perennial) and Tenmile Canyon, Ferry Canyon, and Snipion Canyon (seasonal). These streams eventually drain to the John Day River and then to the Columbia River.

Summer steelhead, which are federally listed as threatened under the Endangered Species Act, have been reported in portions of Hay Creek, Ferry Canyon, Dry Fork Hay Creek, and Sixmile Canyon. Tenmile and Snipion Canyons could also support summer steelhead, although habitat maps do not indicate the presence of this species in these two streams.

The Pacific lamprey, listed by the state as vulnerable, may be present in some streams in the project vicinity. Non-listed fish species in the general project vicinity may include redband trout, red sided shiner, largescale sucker, bridge lip sucker, long nose dace, speckled dace, torrent sculpin, and mottled sculpin.

Potential Impacts and Mitigation Measures

No impacts to fish are expected, and no mitigation would be required.

Vegetation

Affected Environment

Cultivated winter wheat (*Triticum* spp.) and spring barley (*Hordeum* spp.) compose the dominant vegetation cover in the project site and study area. Some of the more sloping areas have been converted to Conservation Reserve Program (CRP) status and planted with crested wheatgrass and like perennials. The steepest lands (outside the project site and study area) support some high-quality native shrub-steppe communities (sagebrush and bunch grass), usually within the lower reaches of the drainage draws and away from cultivated areas. No special vegetation resources, such as high-quality native plant communities, are present on the project site.

The U.S. Fish and Wildlife Service has indicated that no federally-listed endangered, threatened, proposed, or candidate plant species are known to exist within the project site or study area. No state-listed plant species are present on the project site or in the study area. One state-listed plant (Laurence's milk-vetch, *Astragalus collinus* var. *laurentii*) and two candidate plants (disappearing monkeyflower, *Mimulus evanescens*, and hepatic

monkeyflower, *Mimulus jungermannioides*) have been found within a 10-mile radius of the project site.

Construction Impacts

- Total project (phase 1 and 2) would temporarily disturb approximately 65 acres of cropland during construction, with about 25 acres of cropland remaining in the permanent footprint for the 20-year project life. (Low)
- Approximately 14 acres of CRP land would be temporarily disturbed during construction, with approximately 5 acres permanently impacted (total for phase 1 and 2). Permanent CRP land impact represents approximately 36 percent of CRP land on the project site and approximately 1 percent of CRP land in the study area. (Low)
- Total project (phase 1 and 2) would temporarily disturb approximately 2 acres of non-high-quality shrub-steppe vegetation, with about 1 acre remaining in the permanent footprint for the 20-year project life. This represents less than 1 percent of the total shrub-steppe in the study area. (Low)
- Establishment of noxious weeds. (Low)

Operation and Maintenance Impacts

- Vegetation loss due to fire. (Low)
- Weeds could become established around or downwind of project roads and facilities. (Low)

Decommissioning Impacts

- Similar to construction. (Low)

Mitigation Measures

Mitigation measures for vegetation impacts include:

- Construction corridors would be marked in shrub-steppe plant communities in the vicinity of construction areas to minimize disturbance to this vegetation type.
- To minimize opportunities for weed infestations, exposed soils would be reseeded with a seed mix approved by the Natural Resources Conservation Service and/or reestablished as cropland after construction is complete.
- Construction equipment would be limited to construction corridors and designated tower and building construction and staging areas.
- Due to the rarity of trees in the area, no trees would be removed. In the unlikely event that tree removal is unavoidable, new trees would be planted at a ratio of five trees for every tree lost that has a diameter greater than 4 inches.
- SeaWest or its successor would prepare and implement a Weed Management Control and Response Plan, to be approved by the Gilliam County Weed Control Board. Weed

management would include monitoring site facilities annually for infestation by noxious weeds. Weeds would be controlled in consultation with local landowners. Infestations would be addressed within 2 weeks and reported to appropriate staff at the Gilliam County Weed Control Board.

- All project vehicles would be equipped with basic fire-fighting equipment, including extinguishers, shovels, and other equipment deemed appropriate (such as tools for fighting grass fires).
- Electrical power poles would be placed to minimize impacts on shrub-steppe vegetation and any exposed soil would be revegetated after poles are installed.
- Revegetation guidelines would be prepared and implemented for areas that would be disturbed during construction, with guidelines as to whether native or non-native seed mixes would be used.
- To minimize establishment of noxious weeds, construction crews would limit transport of seeds to agricultural lands from roadside areas by complying with the Weed Management Control and Response Plan.

Wildlife

Special-Status Species

The USFWS identified the bald eagle as the only wildlife species listed as threatened or endangered that is known to occur in the vicinity of the proposed project. No occurrence has been reported for the project site or study area, and no threatened species were observed during the four-season avian surveys conducted for the proposed project. The study area contains marginal habitat for bald eagles, and the project site contains no typical bald eagle habitat. The most likely time for bald eagles to enter the study area or project site would be from late fall to early spring. Bald eagles may occur rarely in the vicinity during winter.

Several state-listed species potentially occur in the project site and study area. Grasshopper sparrow, long-billed curlew, Swainson's hawk, loggerhead shrike, sage sparrow, and silver-haired bat were observed during the project's avian and bat surveys. Other state-listed species, such as olive-sided flycatchers and bank swallows, may fly through the project site and study area during migratory periods.

Birds

In 2000 and 2001, a four-season avian study was conducted by URS, Inc. URS prepared a study plan in consultation with USFWS and ODFW.

Horned lark, western meadowlark, vesper sparrow, and Brewer's blackbird are by far the most common species of any avian group in the project site and study area. They occur throughout the year and accounted for over three-quarters of all bird observations during the avian surveys.

Passerine migration through the study area is believed to be moderate. The area is located between known breeding areas to the north and known wintering areas to the south. Most

migrants are expected to fly past the study area above turbine height rather than lingering to feed or rest because the study area contains little cover or food that may attract migrants to land. Large flocks of migrating passerines were not observed during the avian survey. However, based on local birding reports, several types of passerines migrate through Gilliam County.

Northern harriers were regularly observed during the avian survey. American kestrel was the most commonly observed raptor during the field studies. Red-tailed hawk was the second most commonly observed raptor in the project site/study area.

Swainson's hawks, listed by the state as a sensitive/vulnerable species, were observed soaring and flying at the project site during spring and summer. The nearest Swainson's hawk nest site observed is located more than 3 miles from the project site.

Golden eagles are known to forage within canyons in the general project vicinity. The nearest nesting site found during the nest survey was more than 12 miles from the project site. All golden eagle observations were outside the areas where turbines would be placed.

Species observed in the avian surveys during the hawk migration season were American kestrel, northern harrier, red-tailed hawk, rough-legged hawk, Cooper's hawk, prairie falcon, and golden eagle. Other species not observed in the surveys, but reported to migrate through the general vicinity, include northern goshawk, sharp-shinned hawk, merlin, peregrine falcon, and osprey.

Rough-legged hawks are common winter residents in the study area.

Based on habitat, short-eared and barn owls would be relatively common breeders and residents in the general project vicinity, although the avian surveys resulted in only one short-eared owl observation and no barn owl observations. Great horned owls are also present in the general project vicinity. A great horned owl nest was found 10 miles east of the project site during a spring helicopter survey. The study area also lies within the range of western screech owls and burrowing owls, but none were sighted during the avian surveys.

Several species of owl may migrate through the project vicinity. Snowy owls are expected to be occasional visitors in the general project vicinity; they were reported in November and December 1996 near Condon. Snowy owls were not detected during the avian field survey.

The long-billed curlew, classified by the state as a sensitive/vulnerable species, and killdeer, a common species, are the only shorebirds known to occur in the general project vicinity. Both migrant and resident populations occur. Long-billed curlews were observed during the avian surveys.

A few flocks of ducks and geese were noted in the avian surveys during the fall migration period, but overall, the amount of activity appears relatively low. During fall 2000, one large and one small flock of sandhill cranes, totaling 103 birds, were observed migrating over the study area. Canada geese were observed during summer and fall surveys in 2000.

Mourning doves are relatively common in the study area based on avian surveys.

Bats

Bat surveys conducted with the avian study in July and September 2000 confirmed the presence of big brown bat and silver-haired bat, as well as bats in the genus *Myotis* (likely little brown myotis and California myotis). The state assigns the silver-haired bat's status as sensitive/undetermined.

The bat surveys indicate that most bat activity in the project vicinity occurs in canyons (outside the project site and study area) rather than on the ridgetops where the project turbines would be installed. In general, important bat habitat such as roost sites (where bats rest) and foraging areas could be provided by the scattered trees and farm buildings in the project vicinity, and in isolated rock outcrops in Ferry and Tenmile Canyons. The silver-haired bat was detected in the September survey, and is very likely a migrant.

Game Species

Mule deer are common throughout eastern Oregon, including the study area and vicinity. Pronghorn antelope are also present in the general project vicinity. Game bird species in the study area include chukar, gray partridge, California quail, and ring-necked pheasant.

Other Wildlife Species

Common wildlife species expected to occur in the project site, study area, and general project vicinity include mule deer, pronghorn antelopes, cottontails, coyotes, foxes, badgers, bobcats, yellow-bellied marmots, gophers, skunks, ground squirrels, voles, deer mice, pocket mice, pocket gophers, and snakes. Cougars may also occasionally move through the general project vicinity to feed on deer, particularly in winter. Most wildlife activity would be expected to occur on uncultivated lands throughout much of the year, although deer, pronghorn antelopes, voles, snakes, and mice may feed in wheat and barley fields.

Special Habitat Types

CRP lands in the project site and study area provide habitat for snakes and small mammals, raptors, common birds, mule deer, and other wildlife.

No trees are present on the project site, and trees are scarce in the study area, except for a few scattered groves or individual trees usually associated with current or former farms (black locust is the most common tree species). Such upland trees provide habitat for nesting and roosting birds and bats, and they are essential to Swainson's hawks because suitable nest trees are often the limiting factor to the species' distribution and abundance. Trees may also provide forage for browsing mule deer and antelope.

Riparian habitats with trees are not present on the project site and are very rare in the study area and project vicinity. Riparian vegetation other than trees occurs as narrow strips along drainage bottoms in the general project vicinity.

Shrub-steppe is an essential habitat for many native species, including species classified as sensitive by the state such as sage sparrow and loggerhead shrike. The general project

vicinity supports three types of shrub-steppe: big sagebrush/bluebunch wheatgrass, stiff sagebrush/Sandberg's bluegrass, and big sagebrush/gray rabbitbrush/annual grasses.

Streams and wetlands in the study area are discussed below, under "Water Resources and Wetlands."

Scattered human structures in the study area (none on project site) also provide important wildlife habitat. Existing utility poles and fences provide perches for raptors. Abandoned homesteads and associated trees provide hiding and nesting cover for a variety of wildlife.

Construction Impacts

- Construction noise and activities would cause some wildlife to avoid areas of active construction. (Low)
- Approximately 14 acres of CRP habitat disturbed (less than 1 percent of CRP land in study area). (Low)

Operation and Maintenance Impacts

- Annual bird mortality for the full project due to collision with turbines is expected to be 50 to 230 (0.6 to 2.8 birds/turbine/year) (mostly passerines with 0-3 raptors). Annual bat mortality due to collision with turbines is expected to be 60 to 160 (0.7 to 1.9 bats/turbine/year). Some birds may also collide with guy wires of the project's meteorological towers. (Low to Moderate)
- Mortality of birds due to electrocution by electrical transmission lines. (Low)
- General decline in wildlife use of the project site due to the presence of turbines and associated operation and maintenance activities. (Low)

Decommissioning Impacts

- Temporary increase in noise and visual disturbance potentially affecting wildlife. (Low)
- Elimination of bat and avian mortality caused by the project. Wildlife activity and habitat at the project site could return to pre-project conditions. (None)

Mitigation Measures

The following measures would be employed to minimize potential project impacts on wildlife:

- To prevent bald eagles from being attracted to the project site, project personnel and avian monitoring crews would look for large carrion (dead deer or cattle) on the project site between November 15 and March 31 of any given year. If found, large carrion would be relocated from the project site within 24 hours to similar habitats more than 2 miles from the closest turbine. Sites for such relocations would be identified by BPA.
- Due to inherent uncertainty in avian and bat mortality associated with the proposed project, and the need to further scientific understanding of avian and bat mortality

associated with wind energy generation, the following monitoring standards would be implemented:

1. SeaWest or its successor will monitor avian and bat mortality for the first year of the project's life, and submit a quarterly report to BPA, ODFW, and USFWS. The monitoring will follow standard protocols that have been established at other wind resource projects.
2. SeaWest staff (or its successor) will maintain a record of all wildlife injury and mortality that is observed on the project site. This record will include a photographic record of injury and mortality using a standard protocol approved by ODFW and the USFWS.
3. SeaWest or its successor will report, by telephone, injuries or mortalities of species listed in Table 3.6-1 (and any species listed in the future) to the designated BPA, ODFW, and/or USFWS representatives within 24 hours following observation.

Water Resources and Wetlands

No streams exist within the project site or study area, but several streams and drainages occur in the general project vicinity, including Hay Creek to the west, Tenmile Canyon (which drains to Hay Creek) to the north, Ferry Canyon to the east, and Snipion Canyon (which drains to Thirtymile Canyon) to the south. Streams in the general project vicinity typically exhibit poor water quality, including high temperatures, low oxygen levels, and pollution such as sediments, bacteria, fecal coliform, nutrients, and toxic effluents. Smaller streams generally dry up during summer, while larger streams flow year-round.

No wetlands are present on the project site. One 0.1-acre wetland is present in the northern portion of the study area near MP 28. Three seasonal wetlands totaling about 0.17 acre are located within draws just outside the study area. These sites were dry during field studies in July 2000. One pond located just outside the study area is believed to hold water throughout the year.

Potential Impacts

No impacts on water resources and wetlands are anticipated from the proposed project for the following reasons. First, no wetlands are located within 500 feet of proposed wind turbine locations or access roads on the project site. Second, the erosion control and soils management techniques to be employed during construction, operation and maintenance, and decommissioning are expected to prevent fine sediments—the main type of potential pollutant from the project—from being introduced into downstream drainages above existing levels (see Section 3.3 for further discussion of these techniques). Third, it is anticipated that any accidental spills of hazardous or toxic materials used or stored on the project site (fuels, lubricants, solvents) would be in quantities small enough to allow for containment and clean-up before the contaminants reached downstream drainages.

Mitigation Measures

No mitigation for water resources would be required.

Cultural Resources

The primary and traditional Native American groups to utilize the study area were the Cayuse, Umatilla, Walla Walla, and Nez Perce. Sahaptin-speaking Yakama, Warm Springs, and Tenino and the Numic-speaking Northern Paiute also are known to have utilized this area. The ethnographic research shows that as many as 100 plant species were regularly used in past times as food resources and many of these plants maintain their importance in modern times.

Tribal consultation was initiated by BPA, consistent with the agency's 1996 Tribal Policy. Representatives from BPA and SeaWest met with the Cultural Resources Committees of the Confederated Tribes of Warm Springs Reservation and Confederated Tribes of the Umatilla Reservation during the scoping period for the EIS. The purpose of the meetings was to inform the tribes about the proposed project and to hear any comments or concerns they may have regarding it. Both tribes mentioned the presence of native plant species within the project vicinity that were and still are part of traditional root-gathering forays. Prior to cultural resource field surveys, the tribes declined an invitation to take part in walking over the study area but requested an opportunity to comment on the Draft EIS.

Three previously identified hunter-fisher-gatherer sites are recorded adjacent to the study area. These consisted of stone flakes, projectile points, animal bones, shell fragments, and charcoal. One of these sites is eligible for inclusion on the National Register of Historic Places. During the 2000-2001 field surveys, three hunter-fisher-gatherer isolated artifacts were identified north of Richmond Road in the study area. No artifacts were found on the project site.

Recorded historic sites in the study area mainly center on themes of homesteading, ranching, mining, and transportation. These sites date from the late 19th through early 20th centuries. The most common sites are wooden homesteads or cabins or their remains, along with associated features such as wells, outhouses, windmills, trash dumps, and non-native trees. Corrals, fences, flumes, canals, and farm equipment also are present on some sites.

Construction Impacts

- Project construction activities would not adversely affect any previously recorded archaeological site or historic property. (No Adverse Effect)

Operation and Maintenance Impacts

- None anticipated.

Decommissioning Impacts

- Same as construction. (No Adverse Effect)

Mitigation Measures

Mitigation measures for cultural resources include:

- If archaeological or historic materials are discovered during construction, further surface-disturbing activities at the site would cease, and BPA, State Historic Preservation Officer, and Tribal personnel would be notified to ensure proper handling of the discovery.

Visual Resources

The visual setting of the study area includes plateaus of gently rolling hills incised by ravines, undulating fields of grasses, low, dense native shrub-steppe, and a few human elements such as transmission lines, windmills, and buildings. The visual quality of the study area is rural, with no urban or developed areas.

Primary viewer types associated with the proposed project include residents, local or business travelers, occasional recreationists (primarily hunters), agricultural workers, and other types of workers in the area. The most visually sensitive viewers would be people in residences located in or adjacent to the study area.

Construction Impacts

- Temporary alterations to viewscape from construction activities. (Low to High)

Operation and Maintenance Impacts

- Change in viewscape from presence of turbines and meteorological towers. Impacts would be greatest for residential viewers along ORE206 and between Condon and the project site where views of the project are not obstructed. The impacts could be positive or negative, depending on viewer perceptions of wind turbines. (Low to High)

Decommissioning Impacts

- Same as construction. (Low to High)

Mitigation Measures

Mitigation measures for visual impacts include:

- Site all construction staging and storage areas away from locations that would be clearly visible from ORE206 to the extent practical.
- Provide a clean-looking facility by storing equipment and supplies out of sight, if practical; by promptly removing any damaged or unusable equipment; and by promptly repairing or decommissioning (and removing) turbines that are not functioning or not being used.
- Keep turbines and towers clean and touch up paint when needed.
- Coordinate with Oregon and federal recreational facilities and areas, as well as the Oregon Department of Transportation, to determine the feasibility and safety of providing signs directing sightseers along ORE206 to public viewing places that could provide safe viewing areas of the project site.

Socioeconomics, Public Services, and Utilities

Nearly 40 percent of the labor force in Gilliam County is employed in farming. Other employment sectors include transportation and public utilities (23 percent); government (18 percent); wholesale and retail trade (11 percent); services (6 percent); finance, insurance and real estate (2 percent); and construction and mining (less than 1 percent).

The number of people below the poverty level (based on Census threshold definition) was 12 percent in both Gilliam County and the State of Oregon in 1989. In 2000, the racial composition of Gilliam County was approximately 97 percent white and 2 percent Hispanic or Latino, with the rest of the population a mixture of other races. During the same period, the population of Oregon was approximately 87 percent white, 8 percent Hispanic or Latino, 3 percent Asian, and the remainder composed of other races.

Fire service for the project would be provided by the South Gilliam County Rural Fire Protection District. Police service would be provided by the Gilliam County Sheriff's Office, located in downtown Condon.

Gilliam County Medical Center in Condon is staffed by two physician assistants with supervision by a medical doctor from Hermiston. The nearest hospital is located in The Dalles, 70 miles northwest of Condon. The City of Condon is served by a volunteer Emergency Medical Technician crew with two fully equipped ambulances, and by Life Flight helicopters, out of Bend (120 miles south), for major emergencies.

A substation southwest of the project site reduces the 69-kV power from the BPA Condon-DeMoss transmission line to 7.2 kV for distribution. Columbia Basin Electric Co-op, a full-requirements customer of BPA, serves the community.

There are no municipal or cooperative water or sewer systems serving the project site and study area. All farming is dryland.

Solid waste collection in the project vicinity is provided by Columbia Ridge Landfill and Recycling Center, and Sunrise Sanitation.

Construction Impacts

- Potential benefit to local and regional economies through employment opportunities and purchase of goods and services. (Beneficial)
- Minor increased in demand on local emergency response resources such as fire, police, and medical personnel and facilities. (Adverse)
- Potential benefit to minority or low-income people if they become part of the construction workforce. (Beneficial)

Operation and Maintenance Impacts

- Very minor increased in demand for emergency services and schools. (Adverse)
- Local economic benefit from employment opportunities, increased tax revenues and purchase of goods and services. (Beneficial)

- Economic benefit to landowners in the form of annual land lease payments. (Beneficial)

Decommissioning Impacts

- Potential benefit to local and regional economies through employment opportunities and purchase of goods and services. (Beneficial)
- Minor increased in demand on local emergency response resources such as fire, police, and medical personnel and facilities. (Adverse)
- Loss of up to six full-time jobs created as part of the project. (Adverse)
- Potential benefit to minority or low-income people if they become part of the decommissioning workforce. (Beneficial)

Mitigation Measures

- No mitigation measures are required.

Transportation

Highway 19 (ORE19) is a major north-south arterial located approximately 5 miles east of the project site, where it intersects with ORE206 at the City of Condon (Figure S-1). It extends from Interstate 84 along the Columbia River south to Wheeler County, Oregon. Highway 206 (ORE206) extends from Interstate 84 along the Columbia River southeast through Condon and into Morrow County, east of Gilliam County.

Approximately 100 miles of Gilliam County roads are paved, while over 300 miles are gravel roads. Three county roads provide access to the project site: Richmond Lane and Ferry Canyon Road, located east of ORE206, and Old Cottonwood Road, located north of and parallel to ORE206 (Figure S-1).

The average daily two-way traffic (ADT) volume on ORE206 approximately 0.4 mile east of Condon was 238 vehicles in 1999. The 1999 ADT volume on ORE19 (approximately 4 miles south of Arlington) was 855 vehicles. Traffic volumes are not available for Gilliam County roads. However, traffic volume is relatively low, and these roads are generally used to access local residences.

Construction Impacts

- Increase in average daily two-way traffic of 21 to 42 percent on ORE206 and 6 to 12 percent on ORE19 (based on 1999 volumes). (Low)
- Potential for short delays in local traffic during delivery of equipment or components. (Low)

Operation and Maintenance Impacts

- Based on 1999 volumes, average daily trips would increase a maximum of 3 percent on ORE206 and a maximum of 1 percent on ORE19. (Low)

Decommissioning Impacts

- Similar to construction. (Low)

Mitigation Measures

Mitigation measures for transportation impacts include:

- Coordinate routing of construction traffic with Gilliam County Public Works Department.
- Employ traffic control flaggers and signs warning of construction activity and merging traffic as required.
- Repair any damages to state and/or county roads caused by the project.

Air Quality

The air quality attainment status of Gilliam County is not currently classified and air quality in the county is not monitored. Because of the sparse population and rural nature of the area, Gilliam County is likely to be in attainment for all criteria pollutants. Existing sources of air pollution are likely to be minimal.

The climate in the area is very dry (16 inches of precipitation annually). Wind-blown dust is prevalent in non-irrigated agricultural areas such as the project site and study area because soils are often composed of fine-grain silt loams. Dust is generated in such environments by agricultural activities, vehicles traveling on dirt roads, construction, and other activities that disturb soil.

Construction Impacts

- Combustion pollutants from equipment exhaust and fugitive dust particles from disturbed soils becoming airborne. (Low)

Operation and Maintenance Impacts

- Emissions and dust generated from maintenance vehicles and equipment. (Negligible)

Decommissioning Impacts

- Similar to construction. (Low)

Mitigation Measures

No mitigation measures for air quality impacts are necessary beyond standard practices that would be employed to control dust.

Noise

The existing noise environment in the project site and study area is relatively quiet, with occasional noise resulting from vehicles on local roads, scattered farm machinery, wind, and

birds. Background noise levels at locations distant from traveled roadways are relatively low.

Construction Impacts

- Residents in the vicinity of the project site could experience construction noise (associated with grading and earthmoving activities, hauling of materials, building of structures, and construction of turbines) slightly above Oregon noise standards. (Moderate to High)

Operation and Maintenance Impacts

- Two of 12 sound measurement locations in the study area would experience noise above measured background levels but still below Oregon standards. (Low to Moderate)

Decommissioning Impacts

- Similar to construction. (Moderate to High)

Mitigation Measures

Mitigation measures for noise impacts include:

- All equipment would have sound-control devices no less effective than those provided on the original equipment. No equipment would have an unmuffled exhaust.
- No noise-generating construction activity would be conducted within 1,000 feet of an occupied residence between the hours of 10 p.m. and 7 a.m.
- In the event of adjacent landowner complaints, and as directed by the county, the contractor would implement appropriate noise-reducing measures including, but not limited to, changing the location of stationary construction equipment, shutting off idling equipment, rescheduling construction activity, and notifying adjacent residents in advance of construction work.

Public Health and Safety

The study area is a sparsely populated rural area of agricultural land, grassy canyons and ridgetops. Potential hazards in the area include the fire hazard presented by dry crops and grasses, especially in the summer months, and utility crossings. The BPA 69-kV Condon-DeMoss transmission line parallels and crosses the study area, and an underground PGT/PG&E gas pipeline crosses the project site/study area in a southwest-northeast direction. The Condon airport is located approximately 4 miles east of the project site.

Construction Impacts

- Health and safety risks for workers and visitors. (Low)

Operation and Maintenance Impacts

- Potential health and safety risks to workers, farmers, aviators, and visitors. (Low)

Decommissioning Impacts

- Similar to construction. (Low)

Mitigation Measures

- No mitigation measures are required for public health and safety.